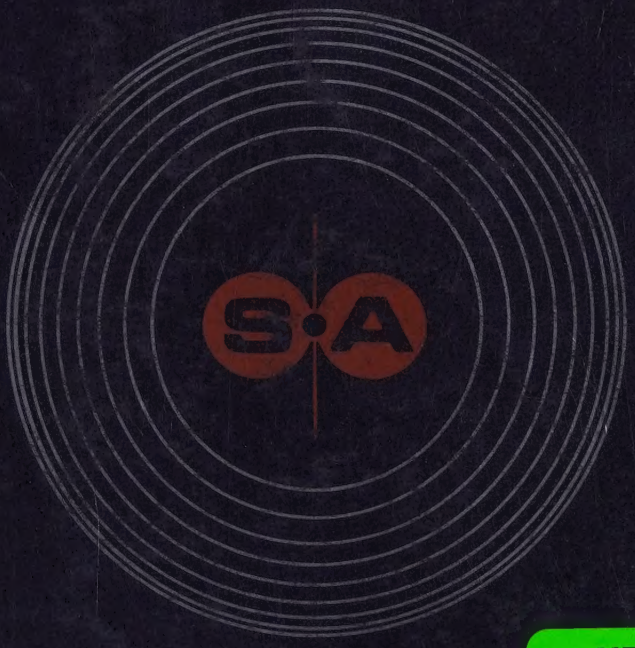
INSTRUCTION MANUAL

SERIES 5911
SOURCE TOWER

SCIENTIFIC-ATLANTA, INC.



MP MASTER
MA29813

When ordering parts from Scientific-Atlanta, Inc., be sure to include the equipment model number, equipment serial number, and a description of the part.

MODEL NO. 5911-30M-S

SERIAL NO. 51-6

SCIENTIFIC-ATLANTA, INC.
P. O. Box 13654, Atlanta, Ga. 30324

INSTRUCTION MANUAL

SERIES 5911
SOURCE TOWER

First Edition
July 1969

Additional copies available at $2

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SECTION 1
GENERAL INFORMATION

1.1 INTRODUCTION

This manual contains the information necessary to properly install and maintain the Scientific-Atlanta Series 5911 Source Towers. A replacement parts list, detail drawings, and an electrical schematic diagram are included.

1.2 GENERAL DESCRIPTION

The Model 5911 Source Towers are fabricated of structural steel angles and channels, and assembled as a truss-type structure having a 4- by 6-foot cross section. The two vertical angles which serve as the front legs of the tower are used as a track for the carriage, which is equipped with steel rollers. The carriage is raised or lowered by a winch and cable drive system.

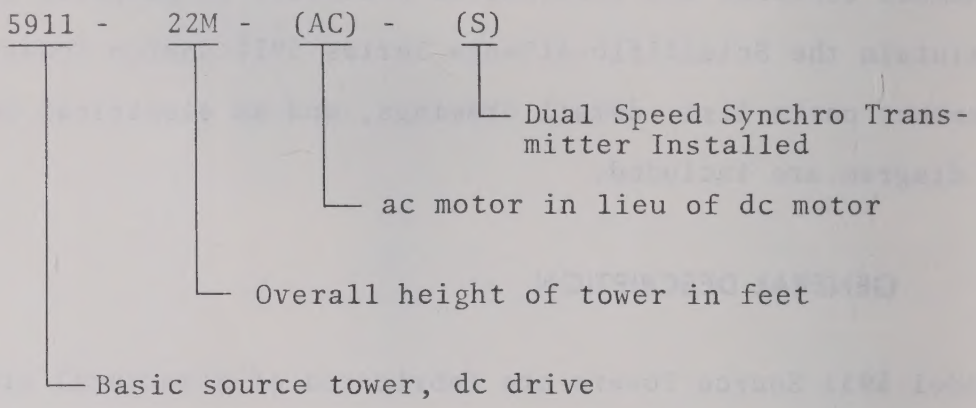
The drive unit consists of a 3/4-hp, dc motor (ac motor optional) with an integral brake, a double reduction worm gear reducer which is coupled to a cable drum, and an adjustable limit switch to control carriage travel. The drive system is controlled by a Scientific-Atlanta Positioner Control Unit, such as the Model 4112 or 4101.

An optional synchro transmitter unit can be installed for monitoring carriage height. In the standard two-speed unit, one synchro

transmitter makes one revolution per 36 feet of carriage travel, and the other one revolution per foot.

1.3 MODEL NUMBER EXPLANATION

The following method is used to determine the model number of a Series 5911 Source Tower.


5911 - 22M - (AC) - (S)
Dual Speed Synchro Transmitter Installed
ac motor in lieu of dc motor
Overall height of tower in feet
Basic source tower, dc drive

1.4 SPECIFICATIONS

Following are the general, pertinent specifications for Model 5911 Source Towers.

Maximum Carriage Speed (All Models)	10 ft/min
Maximum Carriage Load (All Models)	850 lbs.

Model No.	Overall Height (ft)	Carriage Travel (ft)	Maximum Over-Turning Moment (lbf/ft)	Net Weight (lb)
5911-14	14	8	43,000*	1225
5911-18	18	12	58,000*	1415
5911-22	22	16	74,000*	1600
5911-30	30	24	51,000**	2000
5911-42	42	36	87,000**	2560

*This value is equivalent to a 10-foot diameter reflector mounted at the top of the tower in a 100-mph wind.

**These units require guying.

SECTION 2
INSTALLATION

2.1 INTRODUCTION

The source tower is shipped completely assembled, unless other arrangements have been made. Before shipment, the tower is aligned and checked at the factory.

Read this entire section before installing the tower.

2.2 SITE PREPARATION

The specification table on page 1-3 lists the weight and overturning moment (maximum) of each tower, and the tower site should be prepared to accommodate these loads, with a safety factor of at least 1.5:1. The mounting bolt pattern is shown in figure 2-1. Where a concrete pad is used to mount the tower, studs (or "J" bolts) embedded in the concrete may be used to anchor the tower legs. These studs should be 3/4-inch diameter, and project 2-1/2 to 3 inches above the pad surface. They should be threaded for 3/4-10 NC nuts. Inserts or studs must develop holding strength to meet requirements of specification table on page 1-3.

Guy wires are required for the 30- and 42-foot towers, and are furnished with these towers. When the tower is shipped, the clips that attach the guy wire to the tower are not in place, as they would project from the tower structure, and make handling

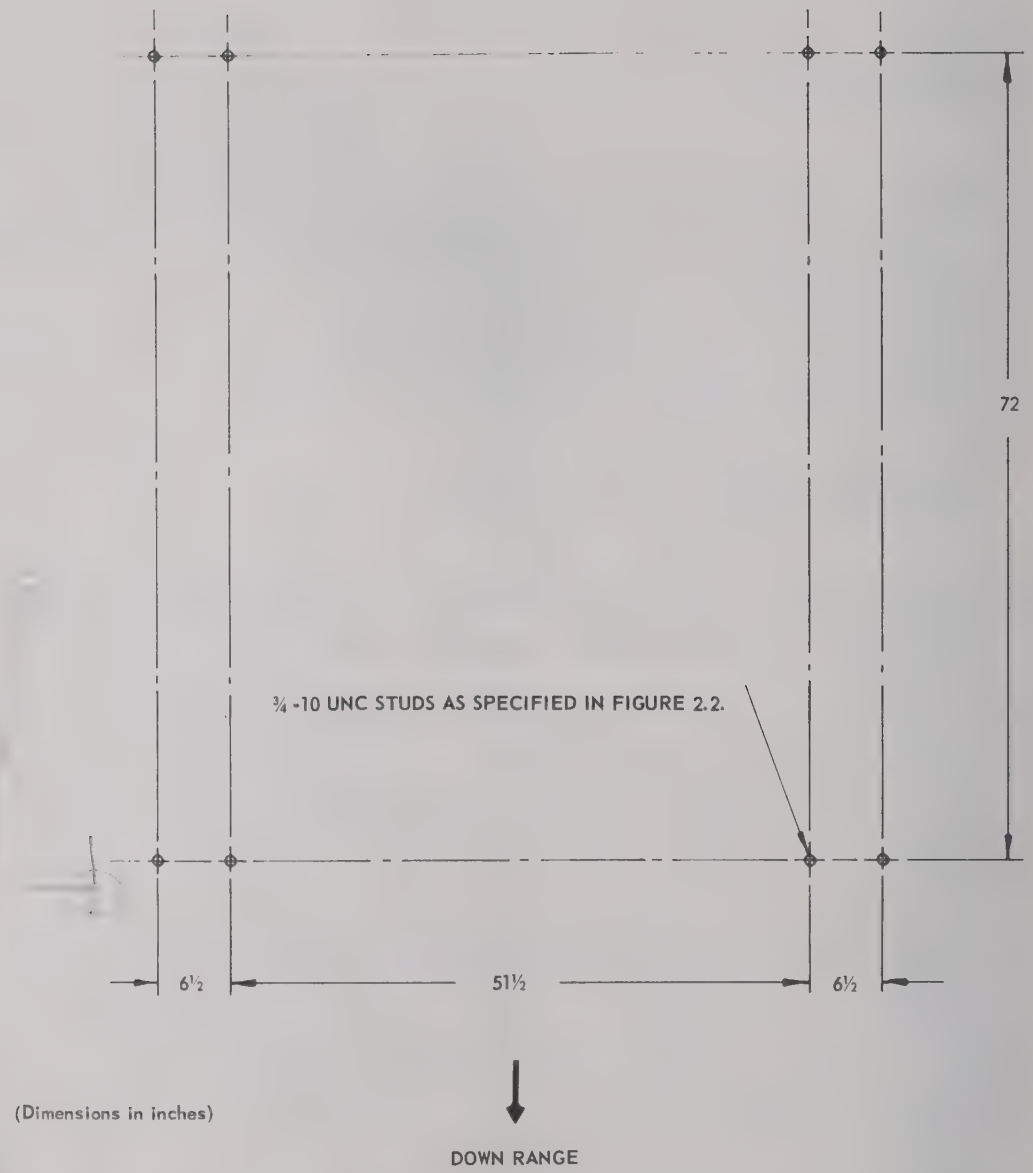


Figure 2-1. Base Mounting Detail

difficult. They should be bolted in place, using the screws, nuts, and washers furnished, as shown in figure 2-2.

Anchors for the guy wires should be placed approximately as shown in figure 2-3 or 2-4. These anchors (or other attachment fixtures) are not furnished with the tower. The type of anchor used is determined by local environment, soil conditions, etc. The anchors should each be capable of withstanding a load of 5700 pounds if applied by the guy wire.

The tower structure is galvanized steel. If holes are drilled in the structure, corrosion protection should be applied to the bare metal.

To keep the electrical control cable(s) that are routed to the carriage from lying on the ground or from becoming entangled in the mechanism, a spar with a cable clamp is furnished with the tower (see figure 2-5). To facilitate handling, this spar may not be in position as it projects from the structure. It should be bolted in place before the tower is erected.

If the tower is equipped with a synchro, the synchro drive chain should be checked to assure that it is on the sprockets, and any tape or string used to anchor the chain in transit should be removed.

The carriage is secured for shipment, and the metal bands or other fasteners must be removed.

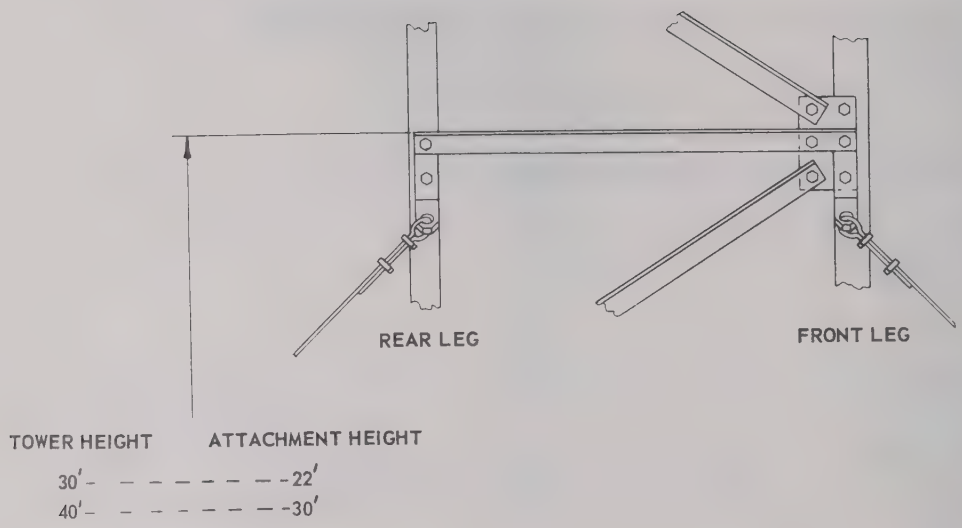


Figure 2-2. Guy Wire Connection to Tower

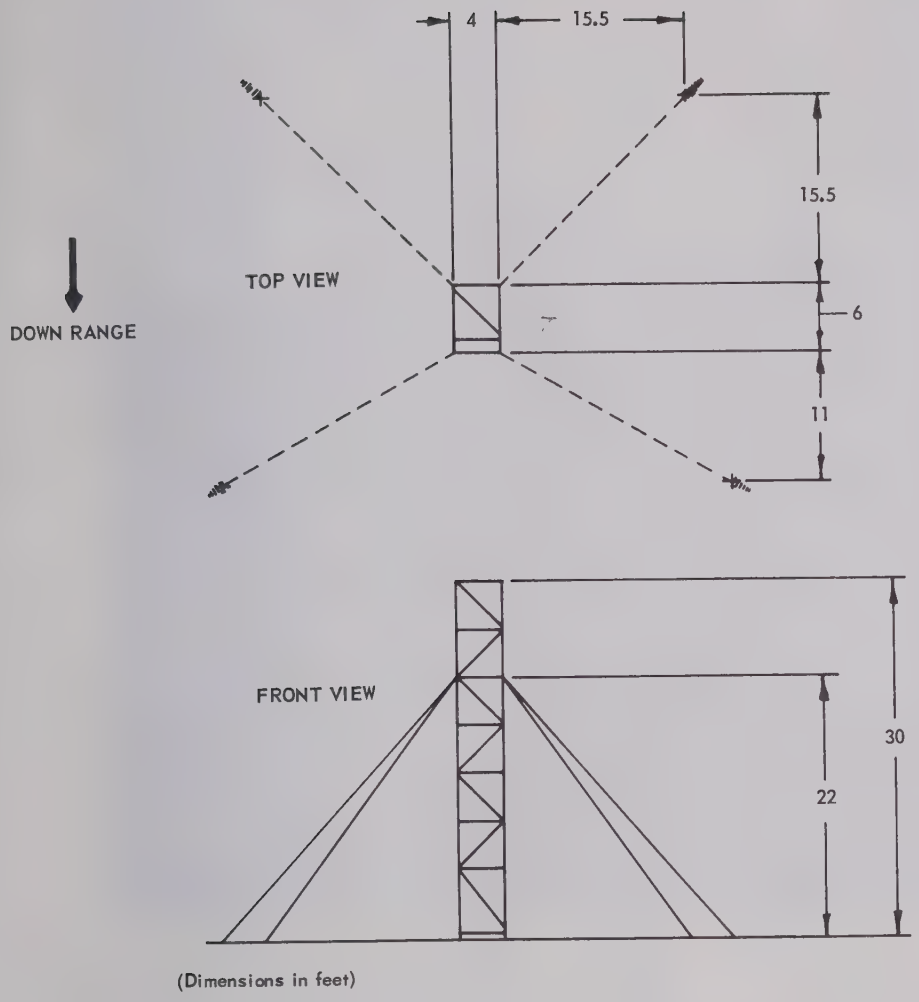


Figure 2-3. 30-Ft. Tower Guy Wire Placement

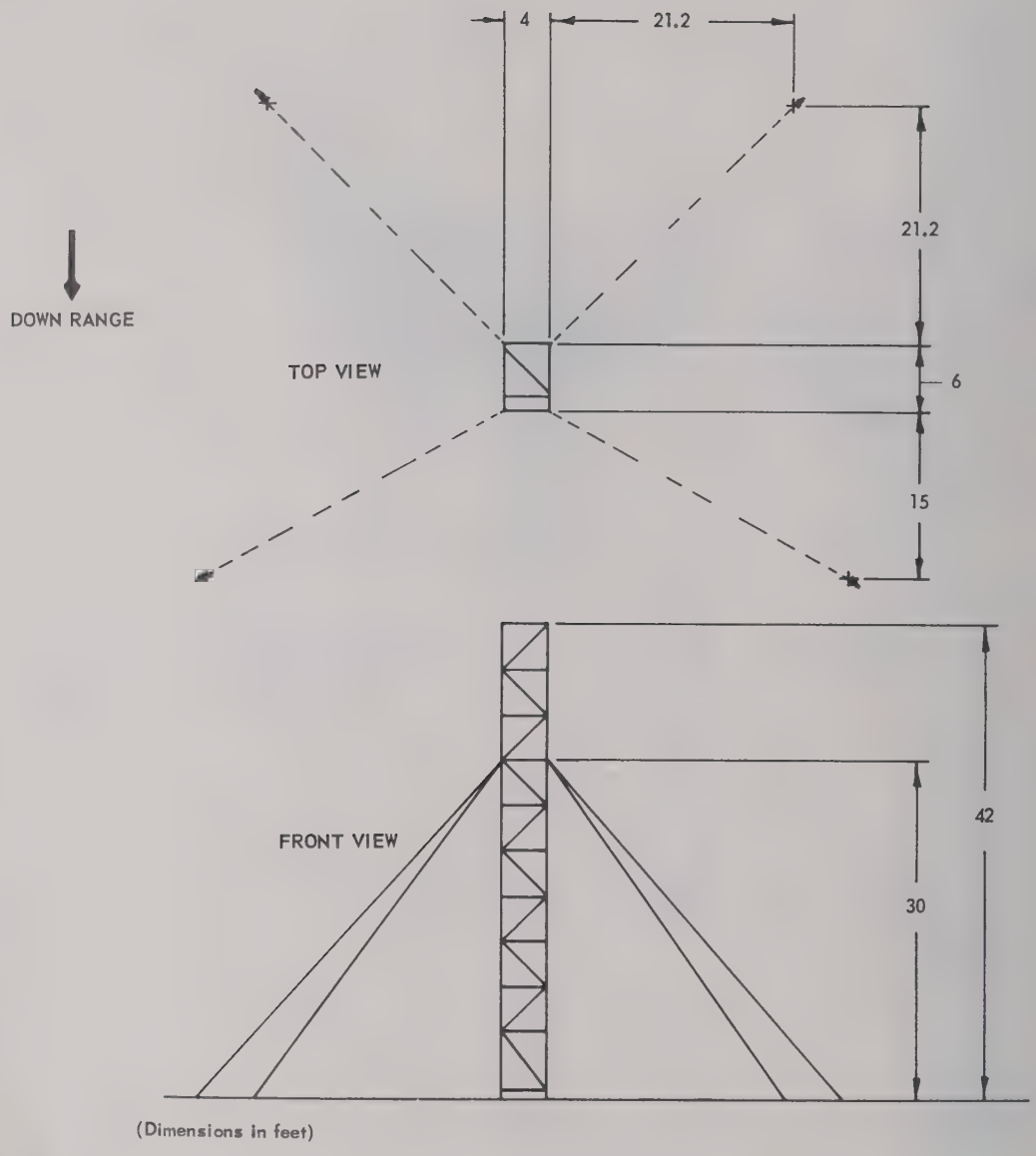


Figure 2-4. 42-Ft. Tower Guy Wire Placement

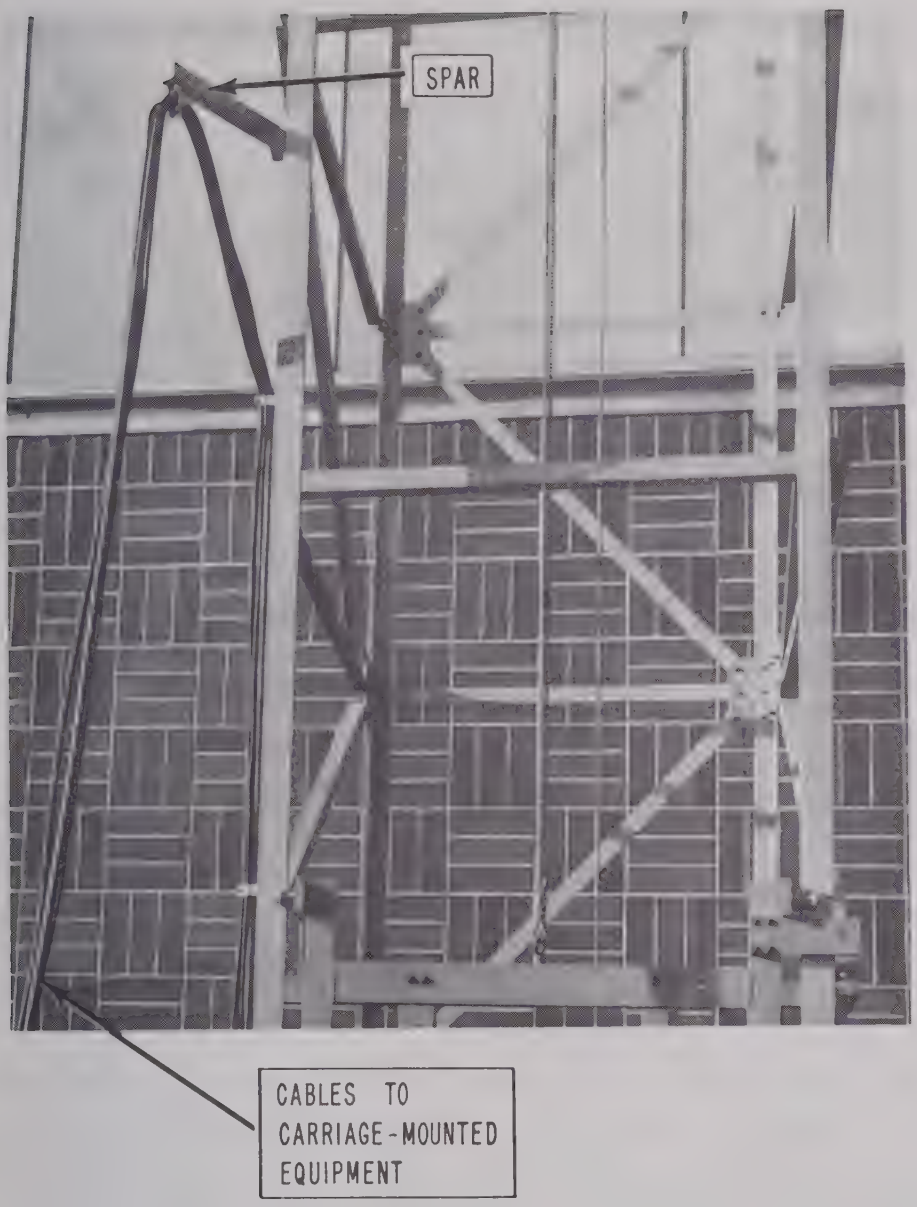


Figure 2-5. Carriage Equipment Cable Routing

2.3 TOWER INSTALLATION

The two smaller towers (14 and 18 feet) can usually be installed using a heavy fork lift truck or similar vehicle. A crane is usually required to install the larger towers.

The tower is simply lowered onto the base, and secured with the type of fasterner selected.

NOTE

If bolts are used, they should be size 3/4-10 NC SAE GRADE 3 or better, and at least 1-1/2 diameter of thread should be engaged.

2.4 PRE-OPERATION CHECK

When the tower is secured in place, and the guys (if required) attached, the following checks should be made prior to regular operation:

a. Remove the drive mechanism cover. The speed reducer was filled with the proper amount of the appropriate lubricant at the factory. The level should be checked and lubricant added if required (see Section III).

b. Inspect cables to see that they are in the pulleys and wrapped smoothly on the drum.

c. If a synchro assembly is installed, check to see that the chain is free, and rides on all sprockets. The synchro drive sprocket may be checked by looking through the openings where the chain passes.

2.5 OPERATION

All cables and wiring for the tower drive, synchro information, polarization positioner or other equipment mounted on the carriage, terminate at a junction box on the side of the tower.

The tower is remotely controlled from a Scientific-Atlanta Series 4100 Positioner Control Unit. This control unit is connected to the tower by Scientific-Atlanta Series 5050 Control Cables (control cables and unit are not furnished with the tower). Where the tower has been connected to an appropriate control unit, it is ready for operation. When the FORWARD-REVERSE switch on the control unit is moved to the FORWARD range, the tower will travel upward. Operate the speed control knob smoothly, avoiding sudden starts or stops. Always set the speed control knob at zero before turning POWER switch ON or OFF.

2.6 LIMIT SWITCH OPERATION

The rotary limit switch coupled to the cable drum has been set to give the specified carriage travel. The switch adjustment should be checked by operating the drive mechanism carefully and allowing the limit switch to stop the carriage movement at each end of travel. If the carriage does not stop before reaching a point 2 inches from where it would come in contact with other parts of the tower, the limit switch should be reset (see SECTION III). The limit switch should also be reset when there is any

danger of equipment mounted on the carriage coming in contact with the ground or overhead structure. Allow 2 inches for overtravel.

For instructions on setting the limit switch, refer to the General Electric Brochure at the end of this section.

During this operation, the electrical control cables anchored to the carriage should be checked to assure that they hang free, and that no tension is applied.

2.7 SYNCHRO TRANSMITTER OPTION

The synchro transmitter, when specified as optional equipment, is fully installed when the tower is shipped from the factory. The synchro transmitter option may also be purchased in kit form and installed on existing towers. The synchro transmitter located on the tower, when coupled by a Scientific-Atlanta Series 5050 Cable to a Scientific-Atlanta Series 4400 Position Indicator Unit, will remotely indicate carriage position. The cable and indicator unit are not included with the tower.

SECTION 3
MAINTENANCE

3.1 GENERAL

The Model 5911 Source Towers should operate under normal service conditions for at least 5 years between overhauls if the recommended service inspections and lubrication schedules are maintained.

3.2 DRIVE MOTOR

The fractional horsepower motor is equipped with permanently lubricated bearings and should require lubrication only during major overhaul.

The brushes in the motor should be checked every 6 months, and replaced when worn to a length of 5/8 inch.

3.3 DRIVE BELT

The motor-reducer drive belt should be inspected every 6 months, and replaced when noticeably worn or frayed. The belt may be removed and a new one installed by loosening the bolts that fasten the motor down and moving the motor toward the reducer to obtain slack in the belt. When installing a new belt, care should be taken not to kink the belt. Excessive wear will occur if the belt is too tight. When tension is correct, the belt will deflect about 1/2 inch under moderate thumb pressure at mid-span.

The belt, regardless of manufacturer, is referred to as a "timing belt" and can usually be obtained from any power transmission equipment distributor. The identification number on the back of the belt such as 285L075, defines the length, width, and pitch of the belt, and should be sufficient identification for ordering a replacement belt.

3.4 LUBRICATION

The worm gear type speed reducers are filled to the proper level with Keystone No. 78-6EP Oil (product of Keystone Lubricating Co., Philadelphia 32, Penna), and this oil is recommended for year around use, as it has an operating temperature range of -20°F to +120°F. It is recommended that the oil be changed every 12 months.

Many lubricating oil companies produce oils specifically for worm gear lubrication, and any good grade of the proper oil may be used with proper consideration to temperature ranges.

Should the operator wish to change brands of oil, the oil should be drained from the reducer and the reducer flushed with Kerosene before adding new lubricant. Do not mix lubricating oils.

Grease fittings on the speed reducer and cable drum shaft bearing should be supplied with 1 to 2 ounces of a good grade of bearing grease every 6 months. Any of the following greases are suitable:

Shell Alvania Grease No. 2

Texaco Regal Starfax No. 2

Gulf XX Lubricant No. 1

Fiske Bros. Refining Co. Lubriplate No. 630AA

The cable pulleys at the top of the tower have permanently lubricated bearings, and require no service.

The sprockets used in the synchro installation are mounted on bronze bearings and require no servicing.

The synchro drive chain should be sprayed every 3 months (or more often in severe service conditions) with a protective lubricant, such as WD40 (product of Rocket Chemical CO., San Diego, Calif).

3.5 CABLES

The carriage lifting cables should be inspected every 6 months and replaced when frayed. In replacing the cables, care must be taken not to kink the cable. The cables should be tensioned so that they are loaded evenly.

3.6 CARRIAGE ROLLERS

The carriage rollers are permanently lubricated but should be inspected every 6 months, and replaced when worn.

3.7 LIMIT SWITCH

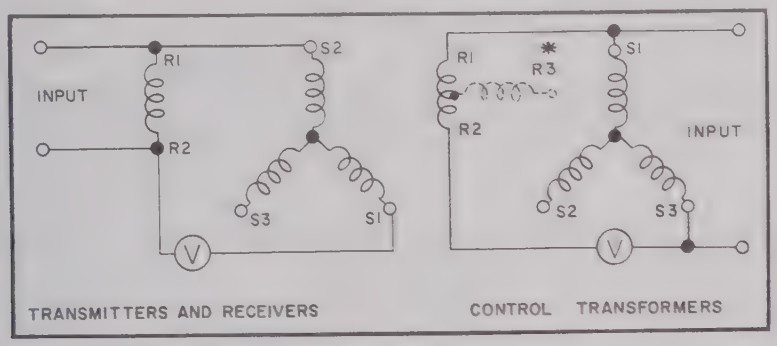
The rotary limit switch used to control carriage travel should require no maintenance.

SYNCHRO ELECTRICAL ZERO

The electrical zero of a synchro is defined as that position of the rotor, with respect to the stator, where the voltage between S1 and S3 is zero and where the voltage from S2 to S1 is in phase with the voltage from R1 to R2.

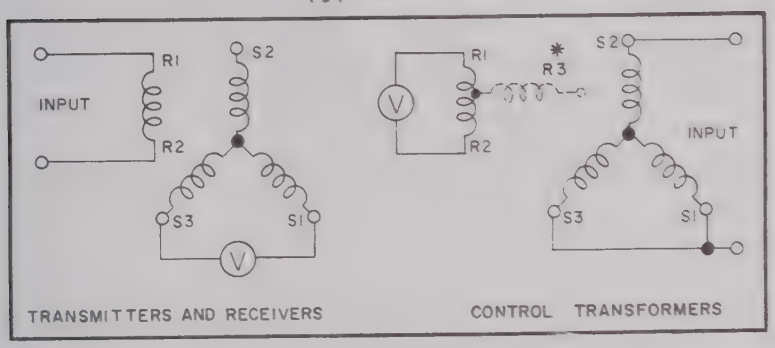
There are two null positions for any synchro. For the correct null, connect the synchro to a voltage source and voltmeter as shown in (A) below; then turn the rotor to determine coarse zero. As the rotor is turned, one null point near the correct electrical zero will be found. To determine the fine electrical zero, connect the synchro as shown in (B) and adjust the rotor slightly until a null is established. This is the exact electrical zero.

(A) COARSE ZERO



*WHEN CDX IS USED AS CT IN S-A TWO-SPEED SYNCHRO PEDESTAL SYSTEMS.

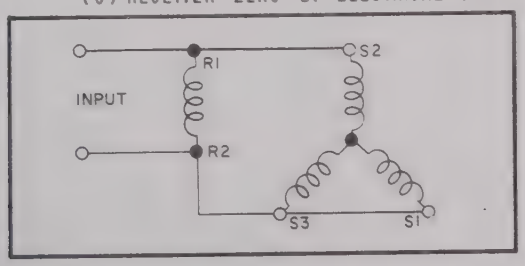
(B) FINE ZERO



*WHEN CDX IS USED AS CT IN S-A TWO-SPEED SYNCHRO PEDESTAL SYSTEMS.

To zero a synchro receiver when its shaft can rotate freely (as in a position indicator), remove all leads from the synchro and reconnect them as shown in (C). The synchro shaft will turn to the electrical zero position when rotor voltage is applied. Do not leave the synchro connected in this manner for more than two minutes, because the synchro will overheat.

(C) RECEIVER ZERO BY ELECTRICAL LOCK



SYNCHRO TROUBLESHOOTING

When connecting or servicing synchro systems, leads may become interchanged. This usually results in rotation opposite to that desired and/or in readings offset by a multiple of 60 degrees. The following table shows the effect and cause of various incorrect connections between a TX and a TR.

If TR rotation with respect to TX is	And With TX on zero, TR reads	Cause is
Opposite	240°	S1-S2 reversed
Opposite	120°	S2-S3 reversed
Opposite	0°	S1-S3 reversed
Same	120°	S1 to S2, S2 to S3, S3 to S1
Same	240°	S1 to S3, S2 to S1, S3 to S2
Same	180°	R1-R2 reversed
Opposite	60°	S1-S2 reversed, R1-R2 reversed
Opposite	300°	S2-S3 reversed, R1-R2 reversed
Opposite	180°	S1-S3 reversed, R1-R2 reversed
Same	300°	S1 to S2, S2 to S3, S3 to S1, and R1-R2 reversed
Same	60°	S1 to S3, S2 to S1, S3 to S2, and R1-R2 reversed

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SECTION 4
REPLACEMENT PARTS LIST

4.1 GENERAL

The replaceable parts lists for the Series 5911 Source Towers are included in this section.

4.2 EXPLANATION OF COLUMN HEADINGS

Description

A brief electrical and/or mechanical description of the component is contained in this column.

S-A Part No.

The Scientific- Atlanta part number is listed in this column.

FSCM

The manufacturer's Federal Supply Code for Manufacturers codes are entered here. The code numbers are from the Federal Supply Code for Manufacturers Cataloging Handbooks H4-1 (Name to Code) and H4-2 (Code to name) effective on the publication date of this manual. Alphabetical codes have been arbitarily assigned to suppliers not appearing in the H4 handbooks. Identifying codes are cross-referenced (code to name) at the end of this section.

Mfr. Part No.

The number assigned to the part by the manufacturer is listed in this column.

4.3 ORDERING PARTS

When ordering parts from Scientific-Atlanta, always include the Scientific-Atlanta part number, the part description, the unit serial number, unit name, subassembly name, part manufacturer, and part manufacturer's part number.

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PARTS LIST INDEX

Figure	Figure No.	Page
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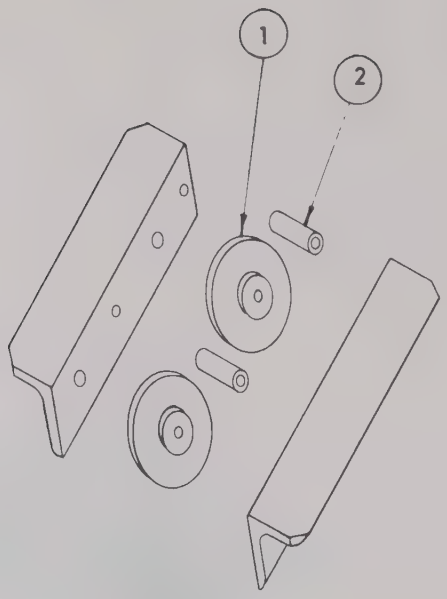
Synchro Option	4-4	4-6

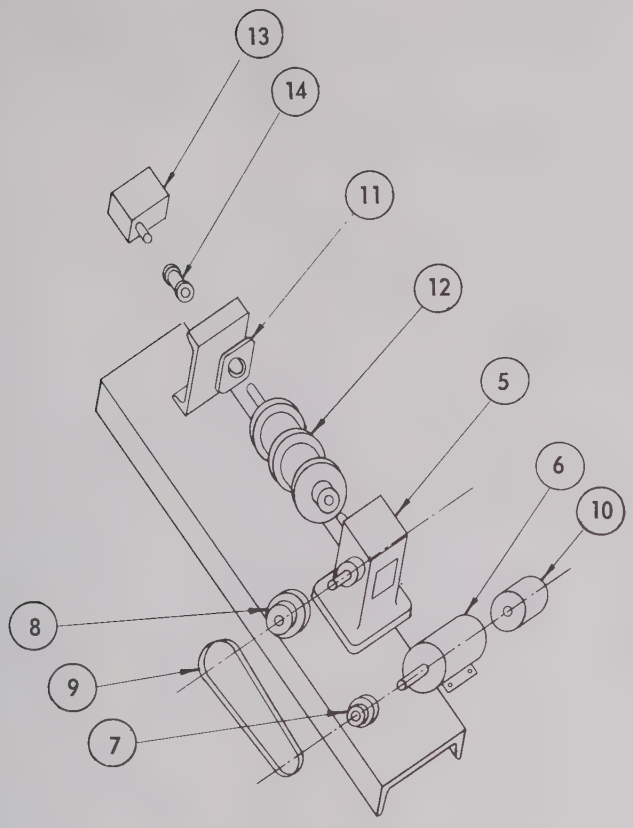


Item	Description	FSCM	Mfg. Part No.
1	Pulley	10110	56042
2	Spacer	10110	56043

Figure 4-1. Upper Cable Sheave

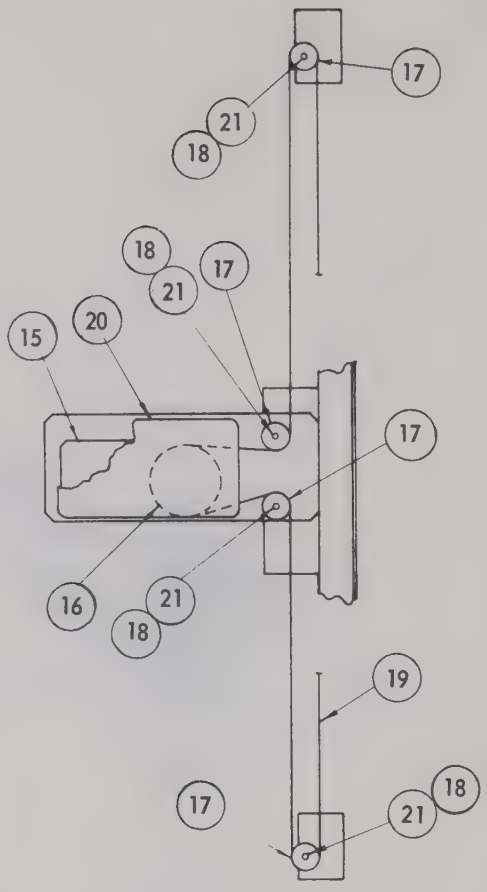
Item	Description	FSCM	Mfg. Part No.
3	Roller, Wide	21335	DPP8
4	Roller, Narrow	21335	DP8A4

Figure 4-2. Carriage



Item	Description	FSCM	Mfg. Part No.
5	Reducer	10110	77440
6	Motor (3/4 HP dc)	10110	79551
7	Motor Pulley	76474	TL81L075
8	Reducer Pulley	76474	TL30L075
9	Timing Belt	76474	270L075
10	Brake	50380	UD51
11	Bearing	21335	RW 1-15/16
12	Drum	10110	54244
13	Limit Switch	24446	CR9441E1F
14	Coupling	75665	L-050

Figure 4-3. Drive Unit



Item	Description	FSCM	Mfg. Part No.
15	Synchro Assembly	10110	4324A
16	Sprocket	10110	92803
17	Idler Sprocket	10110	92793
18	Bearing	10110	70137
19	Chain	10110	76945
20	Cover	10110	65242
21	Shoulder Screw	10110	73533

Figure 4-4. Synchro Option

5911

FSCM CODE LETTER'S

Code	Manufacturer
0110	Scientific-Atlanta, Inc., Atlanta, Ga.
21335	Fafnir Bearing Co., New Britain, Conn.
24446	General Electric, Schenectady, N. Y.
50380	Reliance Electric & Engineering Co., Cleveland, Ohio
75665	Lovejoy Flexible Coupling Co., Chicago, Ill.
76474	Morse Chain Co., Ithaca, N. Y.

SECTION 5
DIAGRAMS

This chapter contains the electrical schematic diagram for a standard 5911 Source Tower. Drawings that are applicable to a special tower, or to a tower accessory, are appended to and made a part of this manual.

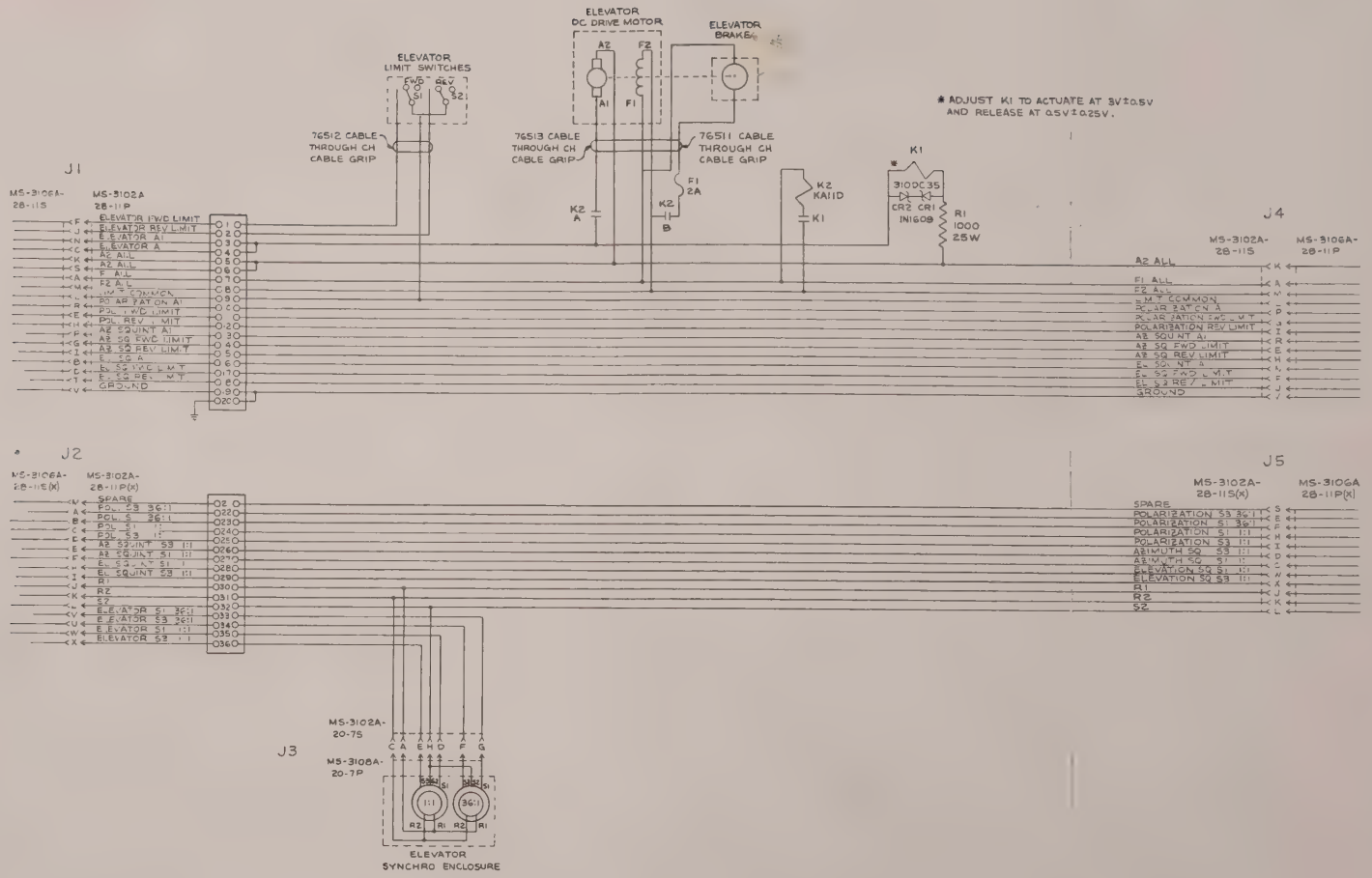


Figure 5-1. Source Tower Schematic Diagram Series 5911

CONVERSION OF VOLTAGE AND POWER RATIOS TO DECIBELS

e basic chart below indicates the number of decibels (dB) rresponding to the listed ratios of voltage or power over the nge of −20 to +20 dB. For voltage or power ratios greater than ose included in the chart, the ratio can be broken down into a oduct of two numbers, the value in dB for each found separately, and the two results added. Example: To convert a power ratio of 2,000:1 to dB, express 2,000 as 2×10^3; the number of dB corresponding to a power ratio of 2 is very nearly 3, and the number of dB for a power ratio of 10^3 is 30. Therefore, the power ratio of 2,000:1 is approximately 30 dB + 3 dB = 33 dB. In the lower righthand corner of the chart dB values for voltage and power ratios of integral powers of 10 are given.

Voltage Ratio	*Power Ratio*	*−dB+*	*Voltage Ratio*	*Power Ratio*	*Voltage Ratio*	*Power Ratio*	*−dB+*	*Voltage Ratio*	*Power Ratio*	*Voltage Ratio*	*Power Ratio*	*−dB+*	*Voltage Ratio*	*Power Ratio*
1.000	**1.000**	**0**	**1.000**	**1.000**	**.447**	**.200**	**7.0**	**2.239**	**5.012**	**.200**	**.0398**	**14.0**	**5.012**	**25.12**
.989	.977	.1	1.012	1.023	.442	.195	7.1	2.265	5.129	.197	.0389	14.1	5.070	25.70
.977	.955	.2	1.023	1.047	.437	.191	7.2	2.291	5.248	.195	.0380	14.2	5.129	26.30
.966	.933	.3	1.035	1.072	.432	.186	7.3	2.317	5.370	.193	.0372	14.3	5.188	26.92
.955	.912	.4	1.047	1.096	.427	.182	7.4	2.344	5.495	.191	.0363	14.4	5.248	27.54
.944	.891	.5	1.059	1.122	.422	.178	7.5	2.371	5.623	.188	.0355	14.5	5.309	28.18
.933	.871	.6	1.072	1.148	.417	.174	7.6	2.399	5.754	.186	.0347	14.6	5.370	28.84
.923	.851	.7	1.084	1.175	.412	.170	7.7	2.427	5.888	.184	.0339	14.7	5.433	29.51
.912	.832	.8	1.096	1.202	.407	.166	7.8	2.455	6.026	.182	.0331	14.8	5.495	30.20
.902	.813	.9	1.109	1.230	.403	.162	7.9	2.483	6.166	.180	.0324	14.9	5.559	30.90
.891	**.794**	**1.0**	**1.122**	**1.259**	**.398**	**.159**	**8.0**	**2.512**	**6.310**	**.178**	**.0316**	**15.0**	**5.623**	**31.62**
.881	.776	1.1	1.135	1.288	.394	.155	8.1	2.541	6.457	.176	.0309	15.1	5.689	32.36
.871	.759	1.2	1.148	1.318	.389	.151	8.2	2.570	6.607	.174	.0302	15.2	5.754	33.11
.861	.741	1.3	1.161	1.349	.385	.148	8.3	2.600	6.761	.172	.0295	15.3	5.821	33.88
.851	.724	1.4	1.175	1.380	.380	.145	8.4	2.630	6.918	.170	.0288	15.4	5.888	34.67
.841	.708	1.5	1.189	1.413	.376	.141	8.5	2.661	7.079	.168	.0282	15.5	5.957	35.48
.832	.692	1.6	1.202	1.445	.372	.138	8.6	2.692	7.244	.166	.0275	15.6	6.026	36.31
.822	.676	1.7	1.216	1.479	.367	.135	8.7	2.723	7.413	.164	.0269	15.7	6.095	37.15
.813	.661	1.8	1.230	1.514	.363	.132	8.8	2.754	7.586	.162	.0263	15.8	6.166	38.02
.804	.646	1.9	1.245	1.549	.359	.129	8.9	2.786	7.762	.160	.0257	15.9	6.237	38.90
.794	**.631**	**2.0**	**1.259**	**1.585**	**.355**	**.126**	**9.0**	**2.818**	**7.943**	**.159**	**.0251**	**16.0**	**6.310**	**39.81**
.785	.617	2.1	1.274	1.622	.351	.123	9.1	2.851	8.128	.157	.0246	16.1	6.383	40.74
.776	.603	2.2	1.288	1.660	.347	.120	9.2	2.884	8.318	.155	.0240	16.2	6.457	41.69
.767	.589	2.3	1.303	1.698	.343	.118	9.3	2.917	8.511	.153	.0234	16.3	6.531	42.66
.759	.575	2.4	1.318	1.738	.339	.115	9.4	2.951	8.710	.151	.0229	16.4	6.607	43.65
.750	.562	2.5	1.334	1.778	.335	.112	9.5	2.985	8.913	.150	.0224	16.5	6.683	44.67
.741	.550	2.6	1.349	1.820	.331	.110	9.6	3.020	9.120	.148	.0219	16.6	6.761	45.71
.733	.537	2.7	1.365	1.862	.327	.107	9.7	3.055	9.333	.146	.0214	16.7	6.839	46.77
.724	.525	2.8	1.380	1.905	.324	.105	9.8	3.090	9.550	.145	.0209	16.8	6.918	47.86
.716	.513	2.9	1.396	1.950	.320	.102	9.9	3.126	9.772	.143	.0204	16.9	6.998	48.98
.708	**.501**	**3.0**	**1.413**	**1.995**	**.316**	**.100**	**10.0**	**3.162**	**10.000**	**.141**	**.0200**	**17.0**	**7.079**	**50.12**
.700	.490	3.1	1.429	2.042	.313	.0977	10.1	3.199	10.23	.140	.0195	17.1	7.161	51.29
.692	.479	3.2	1.445	2.089	.309	.0955	10.2	3.236	10.47	.138	.0191	17.2	7.244	52.48
.684	.468	3.3	1.462	2.138	.306	.0933	10.3	3.273	10.72	.137	.0186	17.3	7.328	53.70
.676	.457	3.4	1.479	2.188	.302	.0912	10.4	3.311	10.96	.135	.0182	17.4	7.413	54.95
.668	.447	3.5	1.496	2.239	.299	.0891	10.5	3.350	11.22	.133	.0178	17.5	7.499	56.23
.661	.437	3.6	1.514	2.291	.295	.0871	10.6	3.388	11.48	.132	.0174	17.6	7.586	57.54
.653	.427	3.7	1.531	2.344	.292	.0851	10.7	3.428	11.75	.130	.0170	17.7	7.674	58.88
.646	.417	3.8	1.549	2.399	.288	.0832	10.8	3.467	12.02	.129	.0166	17.8	7.762	60.26
.638	.407	3.9	1.567	2.455	.285	.0813	10.9	3.508	12.30	.127	.0162	17.9	7.852	61.66
.631	**.398**	**4.0**	**1.585**	**2.512**	**.282**	**.0794**	**11.0**	**3.548**	**12.59**	**.126**	**.0159**	**18.0**	**7.943**	**63.10**
.624	.389	4.1	1.603	2.570	.279	.0776	11.1	3.589	12.88	.125	.0155	18.1	8.035	64.57
.617	.380	4.2	1.622	2.630	.275	.0759	11.2	3.631	13.18	.123	.0151	18.2	8.128	66.07
.610	.372	4.3	1.641	2.692	.272	.0741	11.3	3.673	13.49	.122	.0148	18.3	8.222	67.61
.603	.363	4.4	1.660	2.754	.269	.0724	11.4	3.715	13.80	.120	.0145	18.4	8.318	69.18
.596	.355	4.5	1.679	2.818	.266	.0708	11.5	3.758	14.13	.119	.0141	18.5	8.414	70.79
.589	.347	4.6	1.698	2.884	.263	.0692	11.6	3.802	14.45	.118	.0138	18.6	8.511	72.44
.582	.339	4.7	1.718	2.951	.260	.0676	11.7	3.846	14.79	.116	.0135	18.7	8.610	74.13
.575	.331	4.8	1.738	3.020	.257	.0661	11.8	3.890	15.14	.115	.0132	18.8	8.710	75.86
.569	.324	4.9	1.758	3.090	.254	.0646	11.9	3.936	15.49	.114	.0129	18.9	8.811	77.62
.562	**.316**	**5.0**	**1.778**	**3.162**	**.251**	**.0631**	**12.0**	**3.981**	**15.85**	**.112**	**.0126**	**19.0**	**8.913**	**79.43**
.556	.309	5.1	1.799	3.236	.248	.0617	12.1	4.027	16.22	.111	.0123	19.1	9.016	81.28
.550	.302	5.2	1.820	3.311	.246	.0603	12.2	4.074	16.60	.110	.0120	19.2	9.120	83.18
.543	.295	5.3	1.841	3.388	.243	.0589	12.3	4.121	16.98	.108	.0118	19.3	9.226	85.11
.537	.288	5.4	1.862	3.467	.240	.0575	12.4	4.169	17.38	.107	.0115	19.4	9.333	87.10
.531	.282	5.5	1.884	3.548	.237	.0562	12.5	4.217	17.78	.106	.0112	19.5	9.441	89.13
.525	.275	5.6	1.905	3.631	.234	.0550	12.6	4.266	18.20	.105	.0110	19.6	9.550	91.20
.519	.269	5.7	1.928	3.715	.232	.0537	12.7	4.315	18.62	.104	.0107	19.7	9.661	93.33
.513	.263	5.8	1.950	3.802	.229	.0525	12.8	4.365	19.05	.102	.0105	19.8	9.772	95.50
.507	.257	5.9	1.972	3.890	.227	.0513	12.9	4.416	19.50	.101	.0102	19.9	9.886	97.72
.501	**.251**	**6.0**	**1.995**	**3.981**	**.224**	**.0501**	**13.0**	**4.467**	**19.95**	**.100**	**.0100**	**20.0**	**10.000**	**100.00**
.496	.246	6.1	2.018	4.074	.221	.0490	13.1	4.519	20.42		10^{-3}	30		10^3
.490	.240	6.2	2.042	4.169	.219	.0479	13.2	4.571	20.89	10^{-2}	10^{-4}	40	10^2	10^4
.484	.234	6.3	2.065	4.266	.216	.0468	13.3	4.624	21.38		10^{-5}	50		10^5
.479	.229	6.4	2.089	4.365	.214	.0457	13.4	4.677	21.88	10^{-3}	10^{-6}	60	10^3	10^6
.473	.224	6.5	2.113	4.467	.211	.0447	13.5	4.732	22.39		10^{-7}	70		10^7
.468	.219	6.6	2.138	4.571	.209	.0437	13.6	4.786	22.91	10^{-4}	10^{-8}	80	10^4	10^8
.462	.214	6.7	2.163	4.677	.207	.0427	13.7	4.842	23.44		10^{-9}	90		10^9
.457	.209	6.8	2.188	4.786	.204	.0417	13.8	4.898	23.99	10^{-5}	10^{-10}	100	10^5	10^{10}
.452	.204	6.9	2.213	4.898	.202	.0407	13.9	4.955	24.55	10^{-6}	10^{-11}	110	10^6	10^{11}
											10^{-12}	120		10^{12}

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